

In the Claims

The status of claims in the case is as follows:

1 1. [Currently amended] A method for filling a polygon
2 with a minimum number of rectangles, comprising ~~the steps~~
3 of:

4 bordering said polygon, including:

5 selecting a starting border width; and

6 merging border segments where possible; and then

7 orthogonally filling.

1 2. [Currently amended] A method for filling an original
2 polygon envelope with a minimum number of stripes,
3 comprising ~~the steps~~ of:

4 creating a border polygon;

5 generating orthogonal fill stripes; and

6 processing uncovered areas.

1 3. [Currently amended] The method of claim 2, further
2 comprising ~~the steps of:~~

3 receiving input parameters, said input parameters
4 including parameters defining a minimum stripe width, a
5 maximum stripe width, and a merge adjacent borders
6 flag.

1 4. [Original] The method of claim 2, said input
2 parameters further including stripe overlap amount.

1 5. [Original] The method of claim 3, said input
2 parameters further including wire with ends size delta, and
3 maximum number of borders.

1 6. [Currently amended] The method of claim 3, said ~~step~~

2 of creating a border polygon further comprising the steps
3 of:

4 calculating a maximum current polygon border width
5 parameter for a current polygon;

6 responsive to said maximum current polygon border width
7 parameter, calculating a border width parameter for a
8 current border;

9 creating a border polygon with a width equal to said
10 border width parameter;

11 responsive to said merge adjacent borders flag being
12 enabled, creating a new border including merging said
13 current border with a previous border if possible;

14 responsive to said new border from said merging step,
15 creating a new fill polygon;

16 creating a least encompassing rectangle for said new
17 fill polygon;

18 responsive to said least encompassing rectangle being

19 contained entirely within said original polygon
20 envelope, ending said ~~step of~~ creating a border polygon
21 and passing any uncovered area within said new fill
22 polygon to said generating ~~step~~; otherwise, returning
23 to said ~~step for~~ calculating width to process said new
24 fill polygon as said current polygon.

1 7. [Currently amended] The method of claim 6, said ~~step~~
2 ~~for~~ calculating a maximum current polygon border width
3 further comprising ~~the steps of~~:

4 adjusting said maximum stripe width input parameter to
5 a new upper limit which reflects characteristics of
6 said current polygon as well as any previous border
7 polygons.

1 8. [Currently amended] The method of claim 7, said
2 adjusting ~~step~~ further comprising ~~the steps of~~:

3 calculating the length of each side of said current
4 polygon;

5 deriving a smallest side length parameter equal to the
6 larger of (1) a first factor times said minimum stripe
7 width or (2) the length of the shortest side obtained
8 from said ~~step for~~ calculating length;

9 setting said smallest side length parameter from said
10 deriving ~~step~~ to a reduced amount by a second factor;

11 if said current polygon is an inner border and said
12 smallest side length parameter is less than the
13 previous border width, setting said smallest side
14 length equal to said previous border width;

15 if said smallest side length parameter is greater than
16 said maximum stripe width parameter, setting said
17 smallest side length parameter equal to said maximum
18 strip width parameter; and

19 returning said smallest side length parameter for
20 processing as said maximum current polygon border width
21 parameter.

1 9. [Currently amended] The method of claim 8, said ~~step~~

2 ~~for~~ calculating a border width for a current border further
3 comprising ~~the steps of:~~

4 responsive to said minimum stripe width parameter and
5 said maximum current polygon border width parameter,
6 deriving a border width variable selectively operable
7 for determining that said current polygon is impossible
8 to be bordered or that said generating orthogonal fill
9 stripe ~~step~~ be executed.

1 10. [Currently amended] The method of claim 9, said ~~step~~
2 ~~for~~ deriving a border width variable further comprising ~~the~~
3 ~~steps of~~

4 initializing said border width variable equal to said
5 maximum current polygon border width parameter;

6 rounding said border width variable;

7 if said border width variable exceeds said maximum
8 stripe width parameter, setting said border width
9 variable equal to said maximum stripe width parameter;

10 iteratively shrinking and expanding said current
11 polygon with a shrink value equal to said border width
12 variable;

13 if said shrinking ~~step~~ causes said current polygon to
14 shrink to nothing, then indicating a solution is not
15 possible;

16 if said shrinking and expanding ~~steps~~ create a new
17 polygon which completely covers said current polygon,
18 then terminating said iteratively shrinking and
19 expanding ~~steps~~ and returning said border width
20 variable for use in subsequent processing; and

21 if said shrinking and expanding ~~steps~~ create a polygon
22 which does not cover said current polygon, then
23 returning said minimum strip width parameter for use as
24 said border width variable in subsequent processing.

1 11. [Currently amended] The method of claim 6, said ~~step~~
2 ~~for~~ generating orthogonal fill stripes, further comprising
3 ~~the steps of:~~

4 analyzing areas to be filled to determine optimal
5 stripe direction; and

6 iteratively generating fill stripes in said optimal
7 stripe direction to fill said areas to be filled.

1 12. [Currently amended] The method of claim 6, said ~~step~~
2 ~~for~~ processing uncovered areas further comprising ~~the steps~~
3 of:

4 locating all uncovered polygon areas by subtracting the
5 union of all existing fill shapes from said original
6 polygon envelope; and

7 iteratively process each said uncovered polygon area,
8 selectively bordering and orthogonally filling those
9 uncovered polygon areas which are exterior polygons,
10 and filling with a single rectangle uncovered polygon
11 areas which are interior polygons.

1 13. [Original] The method of claim 8, said first factor
2 being 3 and said second factor being 0.8.

1 14. [Original] An artwork generating system, comprising:
2 an exposure tool for exposing a glass master to a
3 polygon envelop as a plurality of polygon fill stripes;
4 a polygon fill control module defining an optimum set
5 of said polygon fill stripes for filling said polygon
6 envelope, said control module being operable for
7 generating a first plurality of fill stripes
8 comprising a plurality of border polygons;
9 generating zero to a plurality of orthogonal fill
10 stripes; and
11 generating zero to a plurality of fill stripes for
12 processing uncovered areas.

1 15. [Currently amended] A method for filling an original
2 polygon envelope with a minimum number of stripes,
3 comprising ~~the steps of:~~

4 generating a first plurality of stripes for creating a
5 border polygon;

6 generating a second plurality zero or more stripes
7 comprising orthogonal fill stripes; and

8 generating a third plurality of zero or more stripes
9 for processing uncovered areas.

1 16. [Original] A system for filling an original polygon
2 envelope with a minimum number of stripes, comprising:

3 means for generating a first plurality of stripes for
4 creating a border polygon;

5 means for generating a second plurality of zero or more
6 stripes comprising orthogonal fill stripes; and

7 means for generating a third plurality of zero or more
8 stripes for processing uncovered areas.

1 17. [Currently amended] A program storage device readable

2 by a machine, tangibly embodying a program of instructions
3 executable by a machine to perform a method ~~steps~~ for
4 filling an original polygon envelope with a minimum number
5 of stripes, said method ~~steps~~ comprising:

6 generating a first plurality of stripes for creating a
7 border polygon;

8 generating a second plurality of zero or more stripes
9 comprising orthogonal fill stripes; and

10 generating a third plurality of zero or more stripes
11 for processing uncovered areas.

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1 18. [Original] An article of manufacture comprising:

2 a computer useable medium having computer readable
3 program code means embodied therein for filling an
4 original polygon envelope with a minimum number of
5 stripes, the computer readable program means in said
6 article of manufacture comprising:

7 computer readable program code means for causing a

8 computer to effect generating a first plurality of
9 stripes for creating a border polygon;

10 computer readable program code means for causing a
11 computer to effect generating a second plurality of
12 zero or more stripes comprising orthogonal fill
13 stripes; and

14 computer readable program code means for causing a
15 computer to effect generating a third plurality of zero
16 or more stripes for processing uncovered areas.

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1 19. [Currently amended] A computer program product or
2 computer program element
3 for filling an original polygon envelope with a minimum
4 number of stripes, according to a method comprising the
5 steps of:

6 generating a first plurality of stripes for creating at
7 least one border polygon;

8 generating a second plurality of zero or more stripes
9 comprising orthogonal fill stripes; and

10 generating a third plurality of zero or more stripes
11 for processing uncovered areas.

1 20. [Currently amended] A program storage device readable
2 by a machine, tangibly embodying a program of instructions
3 executable by a machine to perform a method ~~steps~~ for
4 filling an original polygon envelope with a minimum number
5 of stripes, said method ~~steps~~ comprising:

6 receiving input parameters, said input parameters
7 including parameters defining a minimum stripe width, a
8 maximum stripe width, and a merge adjacent borders
9 flag;

10 first generating a first plurality of stripes for
11 creating at least one border polygon;

12 second generating a second plurality of zero or more
13 stripes comprising orthogonal fill stripes; and

14 third generating a third plurality of zero or more
15 stripes for processing uncovered areas;

16 said first generating ~~step~~ including the steps of:
17
18 calculating a maximum current polygon border width
19 parameter for a current polygon;
20 responsive to said maximum current polygon border
21 width parameter, calculating a border width
22 parameter for a current border;
23 creating a border polygon with a width equal to
24 said border width parameter;
25 responsive to said merge adjacent borders flag
26 being enabled, creating a new border including
27 merging said current border with a previous border
28 if possible;
29 responsive to said new border from said merging
30 ~~step~~, creating a new fill polygon;
31 creating a least encompassing rectangle for said
32 new fill polygon; and

33 responsive to said least encompassing rectangle
34 being contained entirely within said original
35 polygon envelope, ending said ~~step of creating a~~
36 border polygon and passing any uncovered area
37 within said new fill polygon to said ~~step for~~
38 ~~generating step~~ generating a second plurality of
39 zero or more stripes comprising orthogonal fill
40 stripes; otherwise, returning to said ~~step for~~
41 calculating width to process said new fill polygon
42 as said current polygon.

1 21. [Currently amended] A system method for filling an
2 original polygon envelope with a minimum number of stripes,
3 ~~said method steps comprising:~~

4 receiving means for receiving input parameters, said
5 input parameters including parameters defining a
6 minimum stripe width, a maximum stripe width, and a
7 merge adjacent borders flag;

8 first generating means for generating a first plurality
9 of stripes for creating at least one border polygon;

10 second generating means for generating a second
11 plurality of zero or more stripes comprising orthogonal
12 fill stripes; and

13 third generating means for generating a third plurality
14 of zero or more stripes for processing uncovered areas;

1 22. [Re-presented -- formerly dependent claim 8] A method
2 for filling an original polygon envelope with a minimum
3 number of stripes, comprising of:

4 creating a border polygon;

5 generating orthogonal fill stripes;

6 processing uncovered areas;

7 receiving input parameters, said input parameters
8 including parameters defining a minimum stripe width, a
9 maximum stripe width, and a merge adjacent borders
10 flag;

11 said creating a border polygon further comprising:

12 calculating a maximum current polygon border width
13 parameter for a current polygon;

14 responsive to said maximum current polygon border
15 width parameter, calculating a border width
16 parameter for a current border;

17 creating a border polygon with a width equal to
18 said border width parameter;

19 responsive to said merge adjacent borders flag
20 being enabled, creating a new border including
21 merging said current border with a previous border
22 if possible;

23 responsive to said new border from said merging,
24 creating a new fill polygon;

25 creating a least encompassing rectangle for said
26 new fill polygon;

27 responsive to said least encompassing rectangle
28 being contained entirely within said original
29 polygon envelope, ending said creating a border

30 polygon and passing any uncovered area within said
31 new fill polygon to said generating; otherwise,
32 returning to said calculating width to process
33 said new fill polygon as said current polygon;

34 said calculating a maximum current polygon border width
35 including adjusting said maximum stripe width input
36 parameter to a new upper limit which reflects
37 characteristics of said current polygon as well as any
38 previous border polygons by

39 calculating the length of each side of said
40 current polygon;

41 deriving a smallest side length parameter equal to
42 the larger of (1) a first factor times said
43 minimum stripe width or (2) the length of the
44 shortest side obtained from said calculating
45 length;

46 setting said smallest side length parameter from
47 said deriving to a reduced amount by a second
48 factor;

49 if said current polygon is an inner border and
50 said smallest side length parameter is less than
51 the previous border width, setting said smallest
52 side length equal to said previous border width;

53 if said smallest side length parameter is greater
54 than said maximum stripe width parameter, setting
55 said smallest side length parameter equal to said
56 maximum strip width parameter; and

57 returning said smallest side length parameter for
58 processing as said maximum current polygon border
59 width parameter.

1 23. [Re-presented -- formerly dependent claim 9] The
2 method of claim 22, said calculating a border width for a
3 current border further comprising:

4 responsive to said minimum stripe width parameter and
5 said maximum current polygon border width parameter,
6 deriving a border width variable selectively operable
7 for determining that said current polygon is impossible
8 to be bordered or that said generating orthogonal fill

9 stripe be executed.

1 24. [Re-presented -- formerly dependent claim 10] The
2 method of claim 23, said deriving a border width variable
3 further comprising:

4 initializing said border width variable equal to said
5 maximum current polygon border width parameter;

6 rounding said border width variable;

7 if said border width variable exceeds said maximum
8 stripe width parameter, setting said border width
9 variable equal to said maximum stripe width parameter;

10 iteratively shrinking and expanding said current
11 polygon with a shrink value equal to said border width
12 variable;

13 if said shrinking causes said current polygon to shrink
14 to nothing, then indicating a solution is not possible;

15 if said shrinking and said expanding create a new

16 polygon which completely covers said current polygon,
17 then terminating said iteratively shrinking and
18 expanding and returning said border width variable for
19 use in subsequent processing; and

20 if said shrinking and expanding create a polygon which
21 does not cover said current polygon, then returning
22 said minimum strip width parameter for use as said
23 border width variable in subsequent processing.

1 25. [Re-presented -- formerly dependent claim 13] The
2 method of claim 22, said first factor being 3 and said
3 second factor being 0.8.